

NON-PUBLIC?: N  
ACCESSION #: 8712150152

LICENSEE EVENT REPORT (LER)

FACILITY NAME: James A. Fitzpatrick Nuclear Power Plant PAGE: 1 of 3

DOCKET NUMBER: 05000333

TITLE: Reactor Trip From High Neutron Flux Due To Erratic Operation of  
Reactor Water Recirculation Pump Speed Controller

EVENT DATE: 11/08/87 LER #: 87-018-00 REPORT DATE: 12/07/87

OPERATING MODE: N POWER LEVEL: 080

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Hartford N. Keith, Instrumentation and Controls Superintendent

TELEPHONE #: 315-342-3840

COMPONENT FAILURE DESCRIPTION:

CAUSE: X SYSTEM: AD COMPONENT: SC MANUFACTURER: G080

REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: EHS CODES SHOWN IN ( )

At 1934 hours on 11/8/87 with reactor thermal power at 80% a reactor trip occurred as a result of an Average Power Range Monitor (IG) high flux trip. The high flux trip was initiated by a sudden Reactor Water Recirculation System (AD) Pump speed increase. During the event operators responded to the transient by utilizing approved plant procedures. Plant response for the event was within the bounds of transient analysis as discussed in the Final Safety Analysis Report. The root cause of the Recirculation Pump speed increase is believed to have been a malfunction in a pump speed controller remote setpoint/cascade switch. The malfunction appears to have occurred due to the age of the switch. After troubleshooting of the speed control loop, the controller was replaced and the loop returned to normal operation.

The LER number of a similar previous event is LER 85-018-00

(End of Abstract)

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EIIS Codes are shown in ( )

#### Description Of Event

At 1934 hours on 11/8/87 with reactor power at 80% and while making preparations to increase power, the reactor tripped on Average Power Range Monitor (APRM) (IG) high neutron flux.

Preceding the trip, plant operators had balanced (speed demand reference and actual speed matched) the B Reactor Recirculation System (AD) speed control loop and unlocked (reset) the control positioner. Immediately after the unlocking, the B recirculation pump positioner moved causing a rapid speed increase from approximately 55% to 90%. This action resulted in a rapid increase in reactor recirculation flow which caused reactor thermal power to increase and initiated an APRM high flux trip at rated neutron flux.

During the ascension to the 80% power level both the A and B Recirculation pump positioners had been unlocked and locked several times with no transient movement taking place.

Following the reactor trip, all reactor control rods fully inserted to position 00 except, rod 18-31 which was inserted to position 02 and was manually inserted to position 00. Reactor vessel water level initially decreased (due to void collapse) to approximately 164.5 inches of water (normal level 201.5 inches). Reactor water level turned around in the increasing direction by the level error signal as sensed by the Feedwater Control System (SJ) flow control. From this action, reactor water level reached the high level trip before operation personnel could manually trip the B pump and transfer the A pump to manual control. At the high water level (222.5 inches) the Feedwater System Pump and Main Turbine (TA) tripped. Feedwater pump A was restarted for use in level control during the event.

The operators carried out the Reactor Scram procedure (F-AOP-1). Reactor pressure was controlled by the turbine bypass valves and feedwater Pump A to maintain water level. The Reactor Core Isolation Cooling (RCIC) System (BN) and High Pressure Injection Coolant (HPCI) System (BJ) were not required to operate and no Safety Relief Valves lifted.

In addition at the low reactor water level trip (Technical specification setpoint of 177 inches above Top of Active Fuel (TAF)) the Reactor Water

Clean up (RWCU) System (CE) isolated, both Standby Gas Treatment (SBGT) System (BH) initiated and the required drywell and reactor sample lines isolated per design. After the plant was placed in a stable condition procedure for Recovery from an Isolation (F-AOP-15) was carried out and these systems were returned to their normal condition.

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#### Cause of the Event

An initial investigation found the B Recirculation System pump speed controller to be erratic. Jumping action of the controller speed reference (demand) signal was observed while the unit was installed in the control loop. This action was inconsistent and random. The module was removed from the loop and replaced with a spare unit. Bench testing of the unit traced the erratic operation (as observed before the unit was removed from loop) to a slide type selector switch located on the side mounted panel within the controller. The switch appeared to be sensitive to touching or slight pressure applied to mounting panel or movement of the attached wires. When a replacement switch was installed, sensitivity to movement was eliminated. The suspected cause of the switch sensitivity is an age affect (either metal relaxation or formation of contact corrosion). No action is planned at this time to investigate the A speed control unit as both units are scheduled to be replaced in January 1988 by a rate limiter type unit.

#### Analysis Of Event

During the event the plant operators responded to the transient by utilizing approved plant procedures. Plant response for the event was within the bounds of transient analysis discussed in the plant Final Safety Analysis Report.

#### Corrective Actions

Immediate: Recirculation System speed controller was replaced with a spare unit.

Long term: A modification of the Recirculation System speed control is being performed. Engineering of the modification is near completion. This modification will remove the present controller and replace it with a rate limiter type unit. It is expected that this modification will increase the operational stability of the speed loop by replacing aged components and reducing undesirable feedback in the speed control loop.

The LER number at a similar previous event is LER 85-018-00

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LICENSEE EVENT REPORT: 87-018-00

Gentlemen:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report.

If there are any questions concerning this report, please contact Mr. Hartford Keith at (315) 342-3840, Extension 6101.

/s/ R. Converse  
RADFORD CONVERSE

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